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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/612,658	07/02/2003	Michael P. Galligan	4576/4581A(CON)/ENG0012-0	5534

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EXAMINER	
NGUYEN, NGOC YEN M	
ART UNIT	**PAPER NUMBER**
1793	

NOTIFICATION DATE	DELIVERY MODE
01/15/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/612,658	GALLIGAN ET AL.	
	Examiner	Art Unit	
	Ngoc-Yen M. Nguyen	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 October 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5,6 and 30-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5,6 and 30-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114 was filed in this application after appeal to the Board of Patent Appeals and Interferences, but prior to a decision on the appeal. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on October 30, 2007, has been entered.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-3, 5-6, 31-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al (4,455,281) in view of EP 0 831 211.

Ishida et al discloses a method of producing a plate-shaped catalyst unit for NO_x reduction of exhaust gas wherein the catalytic substance if prevented from falling off (note column 2, lines 17-10).

The catalyst unit is produced by a method comprising the steps of spraying molten metal upon the surfaces of a metal plate to allow the molten metal to accumulate thereon to form rough surfaces and depositing a catalyst containing titanium and at

least another catalytic material for NO_x reduction of exhaust gas onto said rough surfaces whereby the catalyst is firmly secured on said rough surfaces (note claim 1). Ishida '281 further discloses that forming the surfaces of the metal plate into rough surfaces is effected by molten metal spraying. In the typical case, a metal wire is heated to be molten by contact resistance of electricity, an electric arc or high temperature flames, and molten metal thus obtained are sprayed together with gas such as compressed air through nozzles on the surfaces of the metal plate in the forms of very small droplets of molten metal allowing the molten metal to solidly secured thereto. As the molten metal sprayed, the same type of material as the metal plate is preferred. Then a catalytic substance is attached onto the surfaces of the metal plate formed into rough surfaces by the molten metal spraying (note column 4, line 62 to column 5, lines 13).

Thus, Ishida '281 fairly teaches that the formation of the rough surfaces by electric arc process, such rough surfaces are considered the same as the claimed anchor layer, would facilitate the bonding between the catalytic substance and the metal carrier.

The metal plate can be thin steel plates, such as ASTM type 430, type 410 and type 304 (note column 4, lines 53-61). Ishida '281 also discloses that a metal wire mesh can be used instead of metal plate (note column 1, lines 55-58). Moreover, the metal plate can be subjected to bending work as shown in Figures 3-4, when those bent plates are piled up, bent portions hold spaces there between, whereby spacers which would otherwise be necessary can be saved, resulting in increased catalytic area (note

column 3, lines 61-68). The shapes shown in Figures 3-4 are considered as having "accordion pleats" or "corrugated" structure. The metal plate in Ishida '281 can also be perforated metal plate (note Figures 7-9).

Since the metal plate in Ishida '281 can be bent, one skilled in the art would be able to use such metal plate to form a conformable catalyst member as required in the instant claims.

For the limitations "to be mounted...an open discharge end" or "for treating noxious components of engine exhaust gas", such limitations are considered as an intended use and regarding such the intended use limitation, it is noted that this is merely a recitation of the intended use of the claimed catalyst body, and that the claimed catalyst body does not depend on the intended use for completeness, but instead the limitations of the catalyst body are able to stand alone; see MPEP. 2111.02 and 2114. Also, it is well settled that terms merely setting forth intended use for, or a properly inherent in, an otherwise old composition do not differentiate the claimed composition from those disclosed in the prior art. ***In re Pearson 181 USPQ 641*** and it is contrary to spirit and patent laws that patents be granted for old compositions of matter based on new uses of compositions where uses consists merely in employment of compositions; patentee is entitled to every use of which invention is susceptible, whether such use be known or unknown to him. ***In re Thuau, 57 USPQ 324.***

The difference is Ishida '281 does not disclose that a tube of corrugated construction.

EP '211 discloses an exhaust emission control device for internal combustion engines (note column 1, lines 11-19). Such device can have a catalytic metal bearing (or support) member that can be a hollow cylinder (i.e., tube), which is made of a porous metal sheet, (note Figures 12-13 and column 11, lines 39-42) or a corrugated porous plate (note Figure 16D). EP '211 further discloses that the "steel sheet" bearing catalytic metal should be understood as not being limited to the construction described in relation to various embodiments and modifications and also as not being limited to the porous sheet (note column 14, lines 17-22). Thus, EP '211 fairly suggests that the hollow cylinder can be made from other type of metal sheet, such as the corrugated porous plate of Figure 16D.

EP '211 further discloses that a support structure can be used (note Figures 5-6, item 23 and column 6, lines 15-45). This support structure is considered the same as the mounting flange as required in the instant claim 32.

For the limitation regarding the shape of the support member, it would have been obvious to one skill in the art at the time the invention was made to shape the catalyst support member of Ishida '281 as a corrugated, perforated tube, as suggested by EP '211 because such shape is desired for catalyst used in internal combustion engine.

Claims 30, 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida '281 in view of EP '211 as applied to claims 1-3, 5-6, 31-34 above, and further in view of Donomoto (4,798,770) or Draghi et al (6,042,879).

The difference not yet discussed is Ishida '281 does not disclose that the anchor layer comprises nickel and aluminum.

However, Ishida '281 teaches that the molten metal sprayed is preferred to be the same type of material as the metal plate (note column 5, lines 9-10) and the metal plate is desired to be heat resistance and corrosion resistance (note column 4, lines 53-61) such as stainless steel. However, the teaching of Ishida '281 should not be limited to just the exemplified metals.

Donomoto '770 discloses that alloys include Ni-Cr alloys, Ni-Al alloys containing 3-20% Al, Ni-Cr-Al alloys, Ni-Cr-Al-Y alloys are heat and corrosion resistant (note column 5, lines 51-63).

Alternatively, Draghi '879 teaches that MCrAlY, where M is nickel and/or cobalt, has corrosion and heat resistant properties (note column 4, lines 7-14). It would have been obvious to one skilled in the art to optimize the composition of the MCrAlY alloy to obtain the desired corrosion and heat resistant properties.

It would have been obvious to use any known metal that is heat and corrosion resistance, such as the MCrAlY alloys suggested by Donomoto '770 or Draghi '879 for the catalyst of Ishida '281 because heat and corrosion metal is desired in Ishida '281.

Claims 1-3, 5-6, 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorynin (5,204,302) in view of EP '211, optionally further in view of Rondeau (4,027,367) and Ishida '281.

Gorynin '302 discloses a catalyst comprising a metallic substrate; an adhesive sublayer diffusion bonded onto said substrate; and a catalytically active layer deposited on said sublayer and a porous layer deposited on said catalytically active layer (note claim 1). The adhesive sublayer is prepared from thermally reactive powders, such as those prepared from nickel and titanium, aluminum with at least one or more of Co, Cr, Mo, Ta, Nb, Ti or Ni or silicon with at least one or more of Ti, Nb, Cr, W, Co, Mo, Ni or Ta (note column 2, lines 25-35). For the composition of the Ni alloy used, it would have been obvious to one of ordinary skill in the art to optimize such composition to obtain the best adhesive layer.

Gorynin '302 further discloses that the catalyst can be used for the purification of waste gases from an internal combustion engine (note column 1, lines 6-10). Gorynin '302 further discloses that because of the strong adhesion of the catalyst layers to the substrate, the catalyst can be corrugated and punched after deposition of the catalyst layer (note column 3, lines 57-60). Furthermore, Gorynin '302 discloses the step of rolling a corrugated catalyst strip into a cylinder (note column 9, lines 64-67).

The adhesive layer in Gorynin is formed by plasma spraying. The thermally reactive powders are introduced into a plasma torch and an exothermic reaction is initiated in the torch. The exothermic powders impinge the substrate where the reaction continues. The heat generated in the reaction causes diffusion of the sub-layer into the substrate resulting in a diffusion bond and strong adhesion of the sublayer to the substrate (note column 3, lines 6-15). Thus, Gorynin '302 fairly teaches that the plasma

spraying process is used to obtain a diffusion layer, which improves the bonding between the two layers.

The process limitation in claim 6 is noted. However, when the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to applicant to establish that their product is patentably distinct and not the examiner to show the same process of making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

Optionally Rondeau '367 is applied as stated below to teach the use of electric arc to form the adhesive layer.

Rondeau '367 discloses a method of thermal spraying a substrate to deposit a self-bonding coating on such substrate, comprising supplying an electric arc thermal spray gun with a wire feed comprising an alloy of nickel and aluminum or titanium, and using such electric arc thermal spray gun, spraying said wire feed onto such substrate to coat the same thereby to establish diffusion bond between such coating and such substrate to provide a self-bonding coating on such substrate (note claim 1). Rondeau '367 discloses that several types of thermal spraying guns are available including combustion flame spray guns, e.g., the oxy-fuel gas type, plasma arc spray guns and electric arc spray guns. Combustion flame spray guns require a source of fuel, such as acetylene, and oxygen and the temperature produced therein are usually relatively low and often incapable of spraying materials having melting points exceeding 5,000°F. Plasma arc spray guns are usually the most expensive type and they produce much higher temperatures than the combustion type, e.g. up to approximately 30,000°F.

Furthermore, plasma arc spray gun require a source of inert gas, such as argon, for creation of the plasma, and the gas flow rate and electric power therefor require extremely accurate control for proper operation. On the other hand an electric arc spray gun simply requires a source of electric power and a supply of compressed air or other gas, as is well known, to atomize and to propel the melted material in the arc to the substrate or target (note column 1, lines 25-43).

In undertaking the method of Rondeau '367 a number of important advantages are realized over the prior art. Firstly, the process uses an electric arc spray gun, which is more economically operated than other thermal spray equipment. Second, the material to be sprayed is supplied as a wire, which is more convenient to use than powder. The wire may be thin strand all the way up to a relatively thick rod as long as it is suitable for spraying through an electric arc spray gun. Third, the wire is readily formed as an alloy of the two primary materials nickel and aluminum or nickel and titanium. Fourth, the cohesive, adhesive and hardness attributes of the coating on an article formed by the method of the invention are generally equivalent to or better than corresponding attributes for a coating on an article sprayed with powder using other thermal spray devices (note paragraph bridging columns 2-3).

Rondeau '367 can be further applied to teach that the wire alloy comprises a minimum of 93% nickel, from 4 to 5.2% aluminum, from 0.25 to 1.00% Ti (note column 4, lines 15-20).

For the intended use limitations, note reasons as stated above.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use electric arc spraying method, instead of plasma spraying, to form the adhesive layer in Gorynin '302, as suggested by Rondeau '367 because electric arc spraying method can form the same diffusion bond between the two layers but it would cost less plus the additional advantages as stated above.

Optionally, Ishida '281 can be applied as stated above to teach that it is known in the art to form an adhesive layer on a substrate of a catalyst by using electric arc spraying process before depositing the catalytic layer in order to form a catalyst that is highly resistant to peel off (i.e. better bonding) (note column 7, lines 62-67).

EP '211 is applied as stated above to teach the desired shape of the catalyst member, i.e., a hollow cylinder.

It would have been obvious to roll the corrugated catalyst strip of Gorynin '302 into a hollow cylinder as suggested by EP '211 because such shape is desirable for an analogous application.

Applicant's arguments and declaration filed October 30, 2007 have been fully considered but they are not persuasive.

Claim 1:

Applicants argue and the Declaration states that Ishida makes a distinction between metal plates (reference number 5) and a catalyst unit (reference number 3).

Granted that there is a distinction, however, as stated in the above rejection, EP '211 is applied to teach the corrugated tube structure for the catalyst unit. Thus, it would

have been obvious to one skilled in the art to shape the metal plates as disclosed in Ishida into the shape of corrugated tube structure, as suggested by EP '211 to form the catalyst unit 3.

Applicants argue that Figures 3 or 4 do not disclose or suggest catalyst members that can be bent along their length and retain the anchor layer on the carrier when the carrier is bent.

Again, the "bent along their length" is only stated in Applicants' claims as an intended use. Since Ishida fairly teaches that the metal plate can be bent to form the desired shapes (note Figures 3 and 4), it could be bent along its length as required by Applicants' claims and since the anchor layer in Ishida is formed by the same method as in Applicants' claimed invention, the metal plate in Ishida would inherently retain the anchor layer on the carrier. In any event, Applicants' claims are drawn to a product, not a process of making the product, thus, the catalyst in Ishida can be formed in the desired shape, bent or otherwise, before the anchor layer is deposed onto the carrier.

Applicants argue and the Declaration states that none of the tertiary references cures the statement that the plates should not yield to deformation.

As clearly disclosed in Ishida, the metal plate can be bent, whether or not it yields to deformation, thus, the metal plate in Ishida can be bent or "curve" as required by Applicants.

Applicants argue and the declaration states that Figures 16 A and 16B do not disclose structures that are bendable.

Again, "to be mounted..." is considered only as an intended use. Furthermore, the "50" in Figures 16A and 16B may have the same components as "50" in Figure 12, however, Figure 16B clearly suggests to one skilled in the art that "50" can be shaped to fit into a bent of an exhaust pipe.

Appellants argue that the carriers in EP '211 do not include an intermetallic anchor layer.

EP '211 is not relied upon to teach the anchor layer. Ishida '281 is applied as stated above to disclose the anchor layer.

Applicants argue that Ishida and EP '221 do not teach or suggest a carrier comprising a corrugated tube.

EP '221 discloses corrugated plate and tube shape, thus, EP '221 fairly suggest a corrugated tube shape since EP '221 teaches that the porous sheet or plate may be of any desired shape, size and quantity (note EP '211, column 14, lines 17-22).

Claims 2-3, 5-6, 31-33

The rejections of the above claims are maintained for the same reasons as stated above.

For claim 5, Applicants argue that the claim requires that the tube of corrugated construction comprises alternating rings separated by annular webs.

In both Ishida '281 and EP '211, corrugated structure is disclosed. By nature, corrugated structure has alternating "hills" and "valleys". The hills are considered as the claimed "rings" and the valleys are considered as the claimed "annular webs".

For claim 31, Appellants argue that Ishida '281 and EP '211 do not teach or suggest a carrier having an elongated body portion to be mounted within a curved or bent pipe with a mounting member.

The hollow tube as shown in Figures 2, 3, 5, 6, 9 A-E, etc., has an elongated body portion as required in Appellants' claim 31 and the tube can be positioned in a bent pipe (note for examples, Figures 16A-B) and a support member can be used (note Figures 5-6, item 23). In any event, "to be mounted" is only an intended use limitation. Claim 32 further requires that the mounting member comprises an annular collar defining a mounting flange.

For claim 32, the support member, item 23 as shown in Figures 5-6, is considered the same as the claimed mounting flange. Varying in design choices for the support member would have been obvious to one of ordinary skill in the art, see In re Dailey as stated above.

For claim 33 further requires that a catalytic material coated on at least some of the body portion of the carrier to provide a catalyst member.

Ishida '281 fairly teaches catalytic material is deposited on the rough surfaces, i.e. anchor layer (note claim 1).

For claim 34, Appellants further argue that neither of the cited references teaches a carrier that can be used in a conformable catalyst member that can be placed in a bent or curved configuration.

This argument is not persuasive because as shown in Figures 16A-16B in EP '211, the catalyst can be "conformed" to fit into a bent of an exhaust pipe.

Applicants argue and the declaration states that Donomoto and Draghi do not teach a conformable or bendable catalyst member as required in Applicants' claims.

These two references are not relied upon to teach the composition for the anchor layer, not to teach the conformable or bendable catalyst member. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

The rejection over Gorynin and other secondary references is maintained for the same reasons as stated above.

Applicants argue and the declaration states that the claimed invention exhibits unexpected results.

The argument and the showing in the declaration were not persuasive because the closest prior art, i.e. Ishida, discloses a metal plate that can be subjected to bending work (note column 1, lines 55-58), not a rigid catalyst as shown in the declaration. Moreover, the alleged unexpected results as shown in the declaration is not commensurate in scope with Applicants' claims because Applicants' claims are drawn to a catalyst product, which can be used in various other applications, other than the process for treating exhaust gas for motorcycle engine as used in the declaration.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner can normally be reached on Part time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (571) 272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ngoc-Yen Nguyen
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Primary Examiner
Art Unit 1793

nmn
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